

the following localities in San Diego County, California (U.S.A.): Otay River Valley, on Otay Ranch, 31 December 1966 (S. C. Williams), 9 males, 13 females; Otay Valley, 10 November 1963, (Benny Nava), 2 males, 1 female; Wildcat Canyon, 5 miles north of town of Lakeside, 9 June 1962 (S. C. Williams), 1 female; Alvarado Canyon, San Diego city, 6 April 1957 (S. C. Williams), 7 females; Alvarado Canyon, San Diego city, 29 December 1963 (S. C. Williams), 1 female and 12 first instars (babies were not born until July 1964); San Diego city, 24 January 1965 (Susie Kasal), 1 female.

This species appears to be one of the more common species in coastal San Diego county, California. Most of the specimens were collected under rocks and other surface cover, but they also appear to be common under flakes of heat fractured granite rocks. In Otay Valley, 12 specimens were removed from an active wood rat (*Neotoma* sp.) nest. In the Wildcat Canyon study area, the specimen was collected in a pit-trap in a chaparral community recovering from a recent fire.

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### Notes on the Biology of *Eucrossus villicornis* LeConte

(Coleoptera : Cerambycidae)

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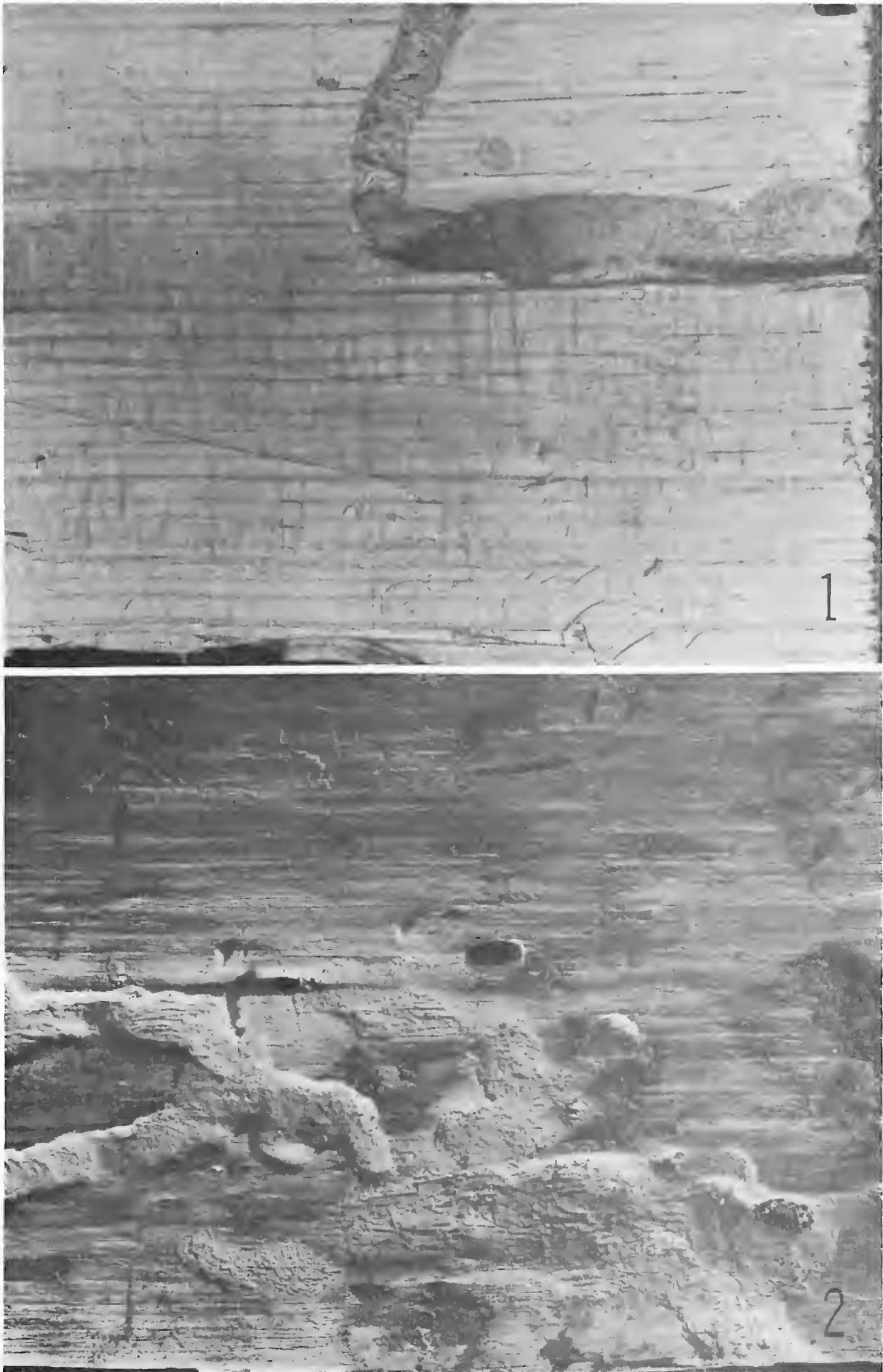
*Eucrossus villicornis* LeConte, a wood borer, has been found in California, Nevada, Arizona, New Mexico, and northern Mexico on *Pinus* spp., including *P. jeffreyi* Grev. & Balf. (Linsley, 1962). It is usually active from April to September. *Eucrossus* LeConte is monotypic in the subfamily Cerambycinae. Craighead (1923) reared specimens of *E. villicornis* LeConte at Falls Church, Virginia, from *P. torreyana* Parry collected at San Diego, California. He states: "The work [of the insect] resembles that of *Callidium antennatum*." But it is not clear whether he meant the resemblance applied to all of the boring activity or only part of it. Perhaps our observations can clarify this point.

In summer of 1965 we reared *E. villicornis* from *P. jeffreyi* logs at Hat Creek, California. The logs had been cut in fall of 1964 near Idlewild, Riverside County, California, from trees infested with *Melanophila californica* Van Dyke (Swain and Wickman, 1968). They had

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FIGS. 1 and 2. *Eucrossus villicornis*. FIG. 1. Pupal chamber at end of larval tunnel in sapwood. FIG. 2. Adult exit hole, center; larval entrance hole, upper left; and larval galleries etching the sapwood before entering the wood.

been allowed to winter in place in the field, and were shipped to Hat Creek in May 1965, then placed outside in cardboard-box rearing cages.

The attacks by *E. villicornis* had apparently been made in mid-summer 1964 shortly after the trees died from the *M. californica* attacks.

Infested logs were radiographed and dissected from June until August in 1965 and again in May 1966 to follow the development and work of *E. villicornis*. Large larvae were found under the bark in June. By July, the larvae were making pupal chambers, and by August, they were pupae and callow adults in the wood. In 38 pupal chambers examined in August 1965, we found: 4 pupae, 18 callow adults, 7 pupae presumably destroyed by ostomid larvae, and 9 pupae dead and covered with a fungus.

*E. villicornis*<sup>3</sup> started emerging from the logs at Hat Creek on 12 August, several weeks after *M. californica*, and stopped emerging in October. One adult emerged in May 1966. All other adults present in the logs were dead.

Larvae worked under the bark, making winding galleries until they were late instar in June and July 1965. Then they bored straight into the wood across the grain to a depth of 40 mm (range 12–76 mm). The larval tunnel in the wood was plugged with coarse, stringy frass—all the way to the pupal chamber (fig. 1).

The pupal chamber is at right angles to the larval tunnel and parallel with the wood grain. The chamber was 40 to 70 mm long and 6 mm in diameter (fig. 1). Pupae were creamy white, 13 to 22 mm long. In each log dissection they were oriented head downward in the standing log. Our observations on boring habits are similar to those made by Tyson (1966) except the larvae in Jeffrey pine did not chew exit holes through the bark before pupating as he reported for *Pinus sabiniana*.

The adults we reared varied in length from 15.5 to 22 mm. The beetles appear to be nocturnal in habit (Linsley, 1962); emerging adults were attracted to a black light placed near infested logs. Adult exit holes in the bark were oval, similar to the larval entrance holes (fig. 2). The adults collected had a 1 : 1 sex ratio.

This insect appears to have a 1-year life cycle in its normal range, but when reared further north in cooler climates (as at Hat Creek) it may have either a 1-year or a 2-year life cycle. The dead pupae found in 1965 and dead adults found in 1966 could have been killed by the lindane sprayed on the logs to control *M. californica*.

<sup>3</sup> Determined by Dr. J. A. Chemsak, Univ. of Calif., Berkeley.



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**The Immature Stages of *Hesperoconopa*  
*dolichophallus* (Alex.)**  
(Diptera : Tipulidae)<sup>1</sup>

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There are five species of *Hesperoconopa* now recorded from the continental United States. The immature stages and their habitats are not described although Alexander (1948, 1949) has indicated that they must be either aquatic or subaquatic. Several larvae and pupae of *Hesperoconopa dolichophallus* (Alex.) were taken in the backwaters and small tributaries of the White River in Mount Rainier National Park, Washington. Second, third, and fourth instar larvae, and pupae were found in patches of fine to coarse sand which were submerged beneath depths of one to twelve inches of swiftly flowing, cold water. Pupae were also taken from habitats where the water had recently receded. The larvae are difficult to separate from those of the genus *Dicranota*, with which they are associated, because of similarity of body coloration, but closer examination reveals the typical eriopterine head capsule of *Hesperoconopa*. The following description is based on ten last instar larval specimens and will serve for all instars except the first, which has not been observed. The pupal description is based on one male and seven female specimens.

HESPEROCONOPA DOLICHOPHALLUS (Alexander)

*Last Instar Larvae*.—Length 10.4-12.6 mm; dextrosinistral and dorsoventral diameters both 0.5-0.6 mm. Body brown, elongate, vermiform, tapering slightly anteriorly. Seventh abdominal segment with dark ring of setae at posterior margin;

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